

A **metric prefix** is a modifier on the root word and it tells us the unit of measure. For example, centigram means we are count in steps of one one-hundredth of a gram, μg means we count by millionths of a gram.

A List of the Metric Prefixes

Prefix	Symbol	Multiplier	
		Numerical	Exponential
yotta	Y	1,000,000,000,000,000,000,000,000	10^{24}
zetta	Z	1,000,000,000,000,000,000,000,000	10^{21}
exa	E	1,000,000,000,000,000,000,000	10^{18}
peta	P	1,000,000,000,000,000,000	10^{15}
tera	T	1,000,000,000,000,000	10^{12}
giga	G	1,000,000,000	10^9
mega	M	1,000,000	10^6
kilo	k	1,000	10^3
hecto	h	100	10^2
deca	da	10	10^1
no prefix means:			10^0
deci	d	0.1	10^{-1}
centi	c	0.01	10^{-2}
milli	m	0.001	10^{-3}
micro	μ	0.000001	10^{-6}
nano	n	0.000000001	10^{-9}
pico	p	0.0000000000001	10^{-12}
femto	f	0.0000000000000001	10^{-15}
atto	a	0.000000000000000001	10^{-18}
zepto	z	0.00000000000000000001	10^{-21}
yocto	y	0.0000000000000000000001	10^{-24}

NAME: _____

DATE: _____

POINTS: ___/25

There are three items - name, symbol, and size - that must be known. Problems could give any one and ask for one or both of the others. Here are only some possible problems (of many):

I. Given either the name or the symbol of the prefix, give the other:

1) c

6) milli

2) k

7) femto

3) T

8) giga

4) μ

9) pico

5) d

10) hecto

A word to the wise: deca- (symbol = da) is a little used unit prefix. This makes it a prime target for teachers to test. Just sayin'.

II. Given the prefix size, give its name:

11) 10^{-15}

12) 1,000

13) 10^9

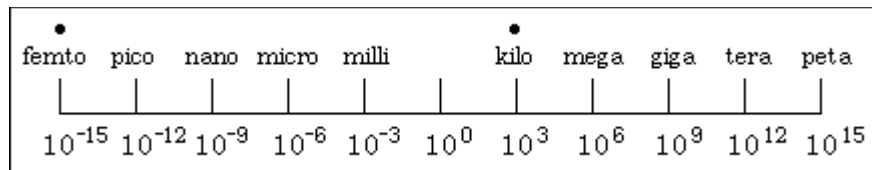
14) 10^{-2}

15) 0.000001

What you should do is compare the two exponents as if they were placed on a number line made of exponents and then compute the absolute exponential distance between them. The key word is absolute. For example, someone might mentally do the distance between kilo and centi by comparing the exponents of positive 3 and negative 2 and getting one. So they reason the distance is 10^1 . They would be wrong.

The absolute exponential distance between 3 and -2 is 5, not 1. Done as an exponent, the absolute exponential distance between kilo- and centi- is 10^5 . In the problems to follow, the exponential form will be the one used. In other words, 10^5 is used in the solution to the problem; the 5 by itself will never be used. The 5 is only used in descriptions about how to determine the distance. Repeat: you will use the proper exponential value (like 10^5) in a solution to a problem; you will NEVER use just the exponent (the 5) in a solution.

Here is a number line with the two prefixes in problem sixteen marked:



Compute the absolute, exponential distance between two given prefixes:

- 16) kilo and femto
- 17) milli and micro
- 18) micro and mega
- 19) centi and pico
- 20) nano and kilo
- 21) deci and tera
- 22) pico and micro
- 23) kilo and giga
- 24) femto and centi
- 25) milli and centi